IN THE CLAIMS:

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing of the Claims:

CLAIMS

1. (Original) A device for use in measuring the temperature of a fluid comprising a structure bearing two temperature sensitive elements adapted to be temporarily exposed to the fluid, wherein the structure provides respective regions for the diffusion of heat from the fluid through the respective said elements, the thermal products of said regions being selected such that, in use, said elements experience different heat transfer rates when exposed to the same fluid temperature.

2. (Original) A device according to claim 1 wherein said temperature sensitive elements are thin film resistance thermometers.

3. (Currently amended) A device according to claim 1 ~~or claim 2~~ wherein said structure comprises a member of a selected material the thickness of which differs in the respective said regions.

4. (Original) A device according to claim 3 wherein said structure comprises a member having an internal cavity at a selected location, a first of the temperature sensitive elements being borne on part of the surface of said member which overlies said cavity and the second of the temperature sensitive elements being borne on part of the surface of said member which does not overly said cavity.

5. (Currently amended) A device according to claim 3 ~~or claim 4~~ wherein said material is a glass, ceramic or quartz.

6. (Currently amended) A device according to claim 1 ~~or claim 2~~ wherein said structure comprises a tubular member of a first material surrounding a member of a second material over part of its length and surrounding a cavity over another part of its length, the second material having a higher thermal product than the first material, a first of the temperature sensitive elements being borne on part of the surface of the said tubular member which overlies said cavity and the second of the temperature sensitive elements being borne on part of the surface of said tubular member which overlies said member of second material.

7. (Original) A device according to claim 6 wherein said first material is a glass, ceramic or quartz and said second material is a metal.

8. (Currently amended) A device according to ~~any one of~~ claims 4 ~~to 7~~ wherein said cavity contains a gas, gas mixture or vacuum.

9. (Currently amended) A device according to claim 1 ~~or claim 2~~ wherein said structure comprises a member composed of first and second materials having first and second thermal products at first and second locations respectively, a first of the temperature sensitive elements being borne on part of the surface of said member at said first location and the second of the temperature sensitive elements being borne on part of the surface of said member at said second location.

10. (Original) A device according to claim 9 wherein said first material is a glass or quartz and said second material is a ceramic.

11. (Currently amended) A method of measuring the temperature of a fluid which comprises temporarily exposing to the fluid a device ~~according to any one of claims 1 to 10~~ comprising a structure bearing two temperature sensitive elements and providing respective regions for the diffusion of heat from the fluid through the respective said elements, the thermal products of said regions being selected such that said elements experience different heat transfer rates when exposed to the same fluid temperature; monitoring the respective temperatures of the

temperature sensitive elements of such device over a period; deriving from respective changes of temperature of said elements the respective heat transfer rates experienced thereby; and deriving the temperature of the fluid from a relationship of the temperatures of said elements and the derived heat transfer rates.

12. (Original) A method according to claim 11 wherein the temperature of the fluid is derived using the relationship:

$$T_t = T_{w1} + q_1 (T_{w2} - T_{w1})/(q_1 - q_2)$$

where T_t is the temperature of the fluid, T_{w1} and T_{w2} are the respective temperatures of the temperature sensitive elements and q_1 and q_2 are the respective heat transfer rates experienced by the temperature sensitive elements.

13. (Currently amended) A method according to claim 11 ~~or claim12~~ wherein the temperature sensitive elements are borne on a curved surface of the structure and the respective heat transfer rates are derived using the relationship:

$$\frac{\partial}{\partial r}\left[k(T)\frac{\partial T}{\partial r}\right] + k(T)\frac{\partial}{r}\frac{\partial T}{\partial r} = \rho c(T)\frac{\partial T}{\partial t}$$

where T is temperature, t is time, r is radius, ρ is density, k is conductivity and c is specific heat capacity, within the respective region within the structure.

14. (Currently amended) Apparatus for measuring the temperature of a fluid comprising a device according to ~~any one of~~ claims 1~~-to 10~~; means for monitoring the respective temperatures of the temperature sensitive elements of such device over a period; and computational means for deriving from respective changes of temperature of said elements the respective heat transfer rates experienced thereby and for deriving the temperature of the fluid from a relationship of the temperatures of said elements and the derived heat transfer rates.

15. (Currently amended) Apparatus according to claim 14 wherein said computational means are adapted to derive the temperature of the fluid using the relationship: ~~specified in claim 12.~~

$T_t = T_{w1} + q_1 (T_{w2} - T_{w1})/(q_1 - q_2)$

where T_t is the temperature of the fluid, T_{w1} and T_{w2} are the respective temperatures of the temperature sensitive elements and q_1 and q_2 are the respective heat transfer rates experienced by the temperature sensitive elements.

16. (Currently amended) Apparatus according to claim 14 ~~or claim 15~~ wherein the temperature sensitive elements are borne on a curved surface of the structure and said computational means are adapted to derive the respective heat transfer rates using the relationship: ~~specified in claim 13.~~

$$\frac{\partial}{\partial r}\left[k(T)\frac{\partial T}{\partial r}\right] + k(T)\frac{\partial}{r}\frac{\partial T}{\partial r} = \rho c(T)\frac{\partial T}{\partial t}$$

where T is temperature, t is time, r is radius, ρ is density, k is conductivity and c is specific heat capacity, within the respective region within the structure.